

BBNA Tribal Energy Efficiency & Conservation Block Grant Program

Administered by Alaska Building Science Network

Ekwok Final Report



Community Summary

Five (5) community buildings owned by the Ekwok Village Council and 47 Tribal Member households received various energy efficient lighting upgrades:

EPA Building,
New Clinic,
Old Clinic,
Rec Center,
Village Council Office
Tribal Member Homes

Retrofits Completed: July 2012

Village-Wide Energy Efficient Lighting Retrofit Summary:

- Retrofitted 40 fluorescent light fixtures with electronic ballasts & T8 lamps
- Installed 72 compact fluorescent light bulbs
- Installed 94 LED A19 bulbs
- Installed 6 LED exterior wall packs Installed 6 security motion sensor fixtures and (16) 14 watt Par 30 LED flood lamps (new/existing fixtures)
- Projected Annual Electrical Savings (kWh): 17,927
- Total Projected Annual Energy Cost Savings: **\$12,549¹**
- Total village-wide In-kind contribution: \$1,656
- Total project cost including In-kind contributions: \$36,123
- Simple Payback (including In-kind contributions): **2.88 years**

¹ kWh Rate [used to calculate electrical cost savings] for Lighting Measures (State of AK - AEA PCE Program Report FY 2011 avg.): \$0.70

EPA Building

Lighting Retrofit Summary:



Materials Installed

Existing Security Motion fixtures – Install (4) 14 watt Par 30 LED lamps

Quantity

2

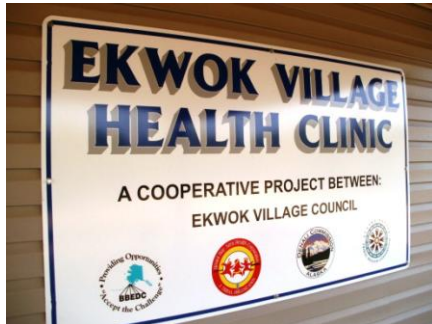
- | | |
|---|------------|
| • Pre-retrofit energy use: | 0.300 kW |
| • Post-retrofit energy use: | 0.056 kW |
| • Energy savings projection: | 0.244 kW |
| • Pre-retrofit to post retrofit energy reduction: | 81 percent |
| • Estimated annual savings: | 427 kWh |

Hours/day (250 days/year)	Electrical Savings (\$)	Avoided Diesel (gal)	Avoided Diesel (\$)
4 Hours/day	\$170.80	52.70	\$315.67
7 Hours/day	\$298.90	92.22	\$552.43
10 Hours/day	\$427.00	131.75	\$789.18
730 Hours/year*	\$124.68	38.47	\$230.44

*Assumes fixtures with motion sensor controls on 2 hrs. /day, 365 days/year

New Clinic

Lighting Retrofit Summary:



Materials Installed

LED 10 watt exterior wall pack w/photocell
LED 30 watt exterior wall pack w/photocell

Quantity

2
3

- Pre-retrofit energy use: 0.584 kW
- Post-retrofit energy use: 0.110 kW
- Energy savings projection: 0.474 kW
- Pre-retrofit to post retrofit energy reduction: 81 percent
- Estimated annual savings: 830 kWh

Hours/day (250 days/year)	Electrical Savings (\$)	Avoided Diesel (gal)	Avoided Diesel (\$)
4 Hours/day	\$331.80	102.38	\$613.23
7 Hours/day	\$580.65	179.16	\$1,073.15
10 Hours/day	\$829.50	255.94	\$1,533.08
4,380 Hours/year*	\$1,453.28	448.41	\$2,685.00

*Assumes fixtures with photo controls on average 12 hrs. /day, 365 days/year

Old Clinic

Lighting Retrofit Summary:



Materials Installed

Security Motion fixture (2) 14 watt Par 30 LED lamps

Quantity

1

- | | |
|---|------------|
| • Pre-retrofit energy use: | 0.250 kW |
| • Post-retrofit energy use: | 0.028 kW |
| • Energy savings projection: | 0.222 kW |
| • Pre-retrofit to post retrofit energy reduction: | 89 percent |
| • Estimated annual savings: | 389 kWh |

Hours/day (250 days/year)	Electrical Savings (\$)	Avoided Diesel (gal)	Avoided Diesel (\$)
4 Hours/day	\$155.40	47.95	\$287.21
7 Hours/day	\$271.95	83.91	\$502.62
10 Hours/day	\$388.50	119.87	\$718.02
730 Hours/year*	\$113.44	35.00	\$209.00

*Assumes fixtures with motion sensor controls on 2 hrs. /day, 365 days/year

Rec Center

Lighting Retrofit Summary:



Materials Installed

Security Motion fixture (4) 14 watt Par 30 LED lamps

Quantity

2

- | | |
|---|------------|
| • Pre-retrofit energy use: | 0.110 kW |
| • Post-retrofit energy use: | 0.056 kW |
| • Energy savings projection: | 0.054 kW |
| • Pre-retrofit to post retrofit energy reduction: | 49 percent |
| • Estimated annual savings: | 95 kWh |

Hours/day (250 days/year)	Electrical Savings (\$)	Avoided Diesel (gal)	Avoided Diesel (\$)
4 Hours/day	\$37.80	11.66	\$69.86
7 Hours/day	\$66.15	20.41	\$122.26
10 Hours/day	\$94.50	29.16	\$174.65
730 Hours/year*	\$27.59	8.51	\$51.00

*Assumes fixtures with motion sensor controls on 2 hrs. /day, 365 days/year

Village Council Office

Lighting Retrofit Summary:



Materials Installed

LED 20 watt exterior wall pack

Quantity

1

Security Motion fixture (2) 14 watt Par 30 LED lamps

3

-
- Pre-retrofit energy use: 0.500 kW
 - Post-retrofit energy use: 0.104 kW
 - Energy savings projection: 0.396 kW
 - Pre-retrofit to post retrofit energy reduction: 79 percent
 - Estimated annual savings: 693 kWh

Hours/day (250 days/year)	Electrical Savings (\$)	Avoided Diesel (gal)	Avoided Diesel (\$)
4 Hours/day	\$277.20	85.53	\$512.32
7 Hours/day	\$485.10	149.68	\$896.56
10 Hours/day	\$693.00	213.82	\$1,280.80
4,380 Hours/year*	\$1,214.14	374.62	\$2,243.96

*Assumes all fixtures operating with photo controls on average 12 hrs. /day, 365 days/year

23 Households Interior Lighting Retrofits

Lighting Retrofit Summary:



Materials Installed

Fluorescent 2 ft. fixture, 2-lamp electronic ballast, (2) 17 watt T8 lamps

Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps

Fluorescent 3-lamp electronic ballast, (2) 25 watt T8 lamps

Fluorescent 4-lamp electronic ballast, (4) 25 watt T8 lamps

CFL-11 W

CFL-14 W

CFL-20 W

CFL-23 W

CFL-9 W

Quantity

23

2

4

5

29

17

1

20

- Pre-retrofit energy use: 6.494 kW
- Post-retrofit energy use: 2.622 kW
- Energy savings projection: 3.872 kW
- Pre-retrofit to post retrofit energy reduction: 60 percent
- Estimated annual savings: 6,776 kWh

Hours/day (250 days/year)	Electrical Savings (\$)	Avoided Diesel (gal)	Avoided Diesel (\$)
4 Hours/day	\$2,710.40	836.29	\$5,009.35
7 Hours/day	\$4,743.20	1463.50	\$8,766.36
10 Hours/day	\$6,776.00	2090.71	\$12,523.30

47 Households LED A19 Bulbs

Lighting Retrofit Summary:



Materials Installed

LED A19 bulb – 7 watt

Quantity

94

- | | |
|---|------------|
| • Pre-retrofit energy use: | 5.640 kW |
| • Post-retrofit energy use: | 0.658 kW |
| • Energy savings projection: | 4.982 kW |
| • Pre-retrofit to post retrofit energy reduction: | 88 percent |
| • Estimated annual savings: | 8,719 kWh |

Hours/day (250 days/year)	Electrical Savings (\$)	Avoided Diesel (gal)	Avoided Diesel (\$)
4 Hours/day	\$3,487.40	1076.03	\$6,445.40
7 Hours/day	\$6,102.95	1883.05	\$11,279.40
10 Hours/day	\$8,718.50	2690.06	\$16,113.40

The **LED “A19”** screw-in style light bulb is among the latest technologies available for lighting energy efficiency. The bulb utilizes Light Emitting Diode (LED) technology which operates more efficiently than the standard Incandescent bulb or spiral-type Compact Fluorescent bulb (CFL). This “60 watt equivalent” LED A19 bulb uses **8 watts** to produce the same light output (lumens) as a **60 watt** incandescent bulb. This particular LED A19 also lasts up to 50,000 hours versus average 8,000 hours for a Compact Fluorescent bulb. In addition, this “outdoor rated” version will operate both in wet and cold weather conditions and will not struggle to turn on in winter.